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Citrus Insect Control For December, 1955

Federal-State Market News Service

A Progress Report On The Burrowing Nematode Work In Florida

Address of President H. A. Thullbery At 68th Annual Meeting Florida State Horticultural Society

Natural Enemy of Citrus Likely To Benefit Florida Growers

The West Indian Or Barbados Cherry

H. A. THULLBERY
Retiring President of the Florida State Horticultural Society

* * * * *

IT'S A DATE — FLORIDA CITRUS EXPOSITION, WINTER HAVEN, FEBRUARY 13 - 18

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VOL. 36 — NO. 12 DECEMBER, 1955 BARTOW, FLORIDA

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R. M. Pratt

Citrus Insect Control

R. B. Johnson

For December 1955

W. L. THOMPSON,
R. M. PRATT
R. B. JOHNSON*
Florida Citrus Experiment Station, Lake Alfred

W. L. Thompson

Red scale infestations were high in November, especially in the Ridge, Indian River, and Orlando Districts. Activity was declining at the end of the month and will continue to decline through most of December, but populations in some groves will still be high enough to carry over the winter by damaging numbers, especially on varieties that will be harvested late.

Purple scale infestations are about normal for this time of year. Activity is declining and there will be little change in the average infestation in December.

Rust mite activity declined slowly through November but was still at a high level at the end of the month. Infestations will be fairly high in December, especially on leaves.

Purple mite activity has been increasing slowly since September and there will be a further increase in December if the weather continues to be dry. Although the average infestation is not very high, except in the Indian River District, it must be remembered that even a moderate infestation in combination with cold weather or dry winds can cause serious damage during the winter months. Considerable firing and leaf drop has already been reported from groves on the east coast and in other areas.

SPRAY PROGRAM

Whether sprays should be applied to control scale insects during December depends mostly upon the severity of the infestation. There is no question that heavy infestations should be controlled. Even though the life cycle is longer during the winter months and increases are consequently slower, heavy infestations can still result in severe damage in the form of fruit and leaf drop as well as dead wood before spring. Whether to control a light infestation is a more difficult question, but in general, the decision to apply control measures should depend upon the location of the scale. Light infestations on leaves and wood will result in very little loss of foliage or increase in dead wood before spring, but even small amounts of purple scale on fruit can result in severe fruit drop. Also, live purple scale and chaff scale on fruit will result in green spots that cannot be removed in the coloring room. Therefore, where scale infestations are light, care should be taken to check fruit, particularly around the stem end. If purple scale is easy to find around fruit stems, control measures should be applied.

Purple mite is the most serious winter problem on citrus. Where sprays are delayed, severe infestations develop rapidly and result in mesophyll collapse, firing and leaf drop. Therefore, as has been recommended over and over, sprays should be applied when purple mite populations are at a low level.

Purple mites are now present on green wood as well as on leaves and many eggs are being laid on the green wood. Where mites cannot be found on leaves, it is wise to look for mites and their eggs on the wood. Even more important, tree tops should be checked, particularly where mites cannot be found on the lower portions of the trees.

As was pointed out last month, with most of the miticides now recommended for winter use, the residual action of the miticide is depended upon to kill the young mites as they hatch from the eggs. Since severe weather conditions tend to reduce miticidal residues, a rain occurring within ten days after the application of sprays may result in a shortened period of control. Where sprays are followed within ten days by rain, it would be advisable to respray before mites that hatch from the eggs present at the time of application mature and lay more eggs.

Rust mite should be kept under control, not only to prevent the late-season form of injury to fruit, but also to prevent defoliation. Severe infestations of rust mite can result in firing and leaf drop, especially during periods of dry, windy weather.

Scale Control: Since oil emulsion is not recommended for winter use, the preferred scalicides are parathion and malathion. Parathion 15 percent wettable powder or its equivalent in other formulations should be used at 1 to 1.7 pounds per 100 gallons. It may be mixed with a maximum of 1 gallon of lime-sulfur and can be combined with any of the recommended miticides. Malathion is particularly useful for scale control where parathion cannot be used, such as adjacent to dwellings. Malathion 25 percent wettable powder is recommended at 3 to 5 pounds per 100 gallons.

Purple Mite Control: DN Dry Mix at 2/3 pound, aramite at 2 pounds or ovex at 1 pound per 100 gallons are all good miticides. Since ovex kills mite eggs but has little effect on mites, and since mite eggs become resistant to ovex when it is used repeatedly, this material should be reserved for use where mite eggs are numerous. Ovex can be used with lime-sulfur, but aramite and DN Dry Mix cannot.

A newer miticide, EPN-300 at 1 pound per 100 gallons has shown considerable promise for winter use. Its greatest disadvantage, however, is the fact that it is an organic phosphate. Protective measures like the precautions used with parathion must also be used with this material.

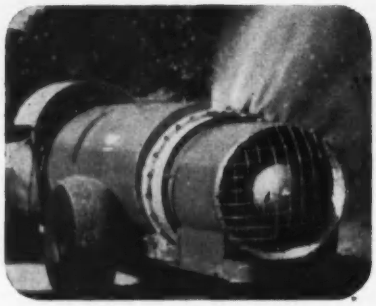
Regardless of the miticide selected, thorough and timely sprays are essential for the longest possible periods of control.

Rust Mite Control: The best spray for winter rust mite control is 1 gallon of lime-sulfur plus 5 to 8 pounds of wettable sulfur.

Sulfur dusts are satisfactory for light infestations if thorough coverage can be obtained. Dusts should be applied when there is no wind, pre-

(Continued on page 15)

* Written November 23, 1955. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; T. B. Hallam, Avon Park; and L. M. Sutton, Lake Alfred.



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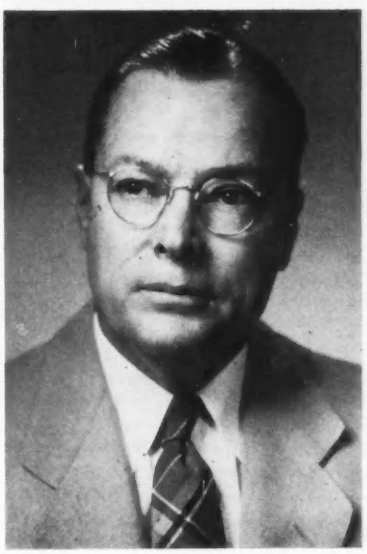
A Progress Report On

The Burrowing Nematode Work In Florida

Spreading decline of citrus was first discovered near Winter Haven, Florida, between 1926 and 1928, but at that time it was not realized that it was potentially an extremely serious threat to the State's citrus industry. In 1953 Drs. R. F. Suit and E. P. DuCharme, Pathologists of the Citrus Experiment Station, Lake Alfred, Florida, demonstrated that the burrowing nematode, **Radopholus similis** (Cobb) Thornes, was the casual oganism.

During the years of investigation of this disease the Citrus Experiment Station workers found that by removing the citrus trees visibly affected by the spreading decline, plus four additional trees in all directions and fumigating the soil with DD at 600 pounds per acre, the spread of the trouble seemed to be stopped. This became known as the pull-and-treat method. Such a program was suggested to growers, particularly where only a small infestation existed in the grove. The pull-and-treat method offered no guarantee of cure, but it did seem to offer a possibility of control until further research could be done to prove this plan to be sound or to develop a better plan of attack.

Subsequent to the discovery of the cause of spreading decline, representatives of the citrus industry requested the State Plant Board to make a systematic survey of the citrus producing area of the State to determine the extent of infestation of this serious trouble. Many growers were anxious to apply the pull-and-treat method in order to protect the healthy portion of their groves or contiguous properties. These growers had to be advised as to what trees should be removed. The research workers could not continue to do this job without seriously interfering with the research program. The State Plant Board agreed to take over the survey work, including the mapping of individual groves to aid the growers in the pull-and-treat program, the processing of root samples and the identification work. The Citrus Station agreed to train Board employees to accomplish this task, and to furnish laboratory and office space where the work could be done.



— By —
PAUL E. FRIERSON
STATE PLANT BOARD OF FLORIDA
GAINESVILLE

AT MEETING FLORIDA STATE HORTICULTURAL SOCIETY

At the request of the Board and of representatives of the industry, the State Budget Commission released $35,000 from emergency funds on January 1, 1954 to augment State Plant Board work on spreading decline. By February 1954, the State Plant Board grove survey was under way. Before the Legislature convened in April 1955, it was necessary to request additional funds to carry on the work already started, and the Budget Commission again released

$35,000 to keep the program operating until June 30, 1955.

The survey work progressed about as expected with many more groves being added to the known infestations. By June 30, 1954, 418 groves had been surveyed, and 100 were found to be infested with the burrowing nematode.

Although research and regulatory officials had considered nursery stock as a possible means of spreading the burrowing nematode, it was not until April 16, 1954, that evidence was found to support this theory. State Plant Board inspectors while making a routine survey of a grove near Sebring noticed visible spreading decline symptoms in several locations in the grove. In almost every instance there was a young reset tree near the center of each of these infestations. Subsequent investigation proved that the nursery from which these trees were obtained was infested with the burrowing nematode. Additional trees were traced from the nursery to other locations and many of those proved to be positive carriers of the nematode also.

In the summer of 1954, the State Plant Board learned that Philodendron plants collected from a nursery in Dade County in 1953 and brought to the Experiment Station at Sanford, Florida, for examination had been found infested with the burrowing nematode by Dr. J. R. Christie, at that time Nematologist with the United States Department of Agriculture. This was before this pest was known to cause the spreading decline disease of citrus, so the information was not considered of great significance since the infested Philodendron plants did not appear to be seriously damaged by the nematode.

As a result of these two discoveries the State Plant Board instituted an intensified survey over an area reaching from Jacksonville to Miami, and extending from coast to coast. Nurseries infested with the nematode were found in almost every county surveyed, and many new hosts appeared as the survey work progressed.

By the fall of 1954, it was seen that more personnel would have to be provided if the survey work was to be increased. The State Plant Board and representatives of the industry requested the United States Department of Agriculture to aid in the fight. In January, 1955, the Department sent a survey team to Florida from the Golden Nematode Project in New York. The State Plant Board provided this team with a mobile laboratory, converted from a 33-foot house trailer. The contribution of this team, headed by Mr. Joseph T. Koski, has added materially to the knowledge of the burrowing nematode and other nematodes in Florida and has aided in bringing to light additional hosts of these pests.

On September 30, 1955, 3,300 groves had been surveyed, and 748 were found to be positive. On the same date, 1,735 nurseries had been examined and 239 were infested with the burrowing nematode. Twenty-nine additional miscellaneous properties were found to be positive out of 300 examined. A total of 61,550 samples were taken; 17,170 of these were from nurseries. There are now 27 counties known to be infested out of 31 in which some survey work has been done. The infested counties are Brevard, Broward, Citrus, Collier, Highlands, Hillsborough, Indian River, Lake, Manatee, Marion, Martin, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Saint Lucie, Sarasota, Seminole, and Volusia.

When citrus nursery stock was found to be a source of infestation of spreading decline, Dr. Wray Birchfield, State Plant Board Nematologist, working at the Citrus Experiment Station, was assigned the job of finding a satisfactory method of treating such plants to make them safe to move. He found that the burrowing nematode was killed by submersion in hot water for 10 minutes at 122°, and that citrus plants of nursery size would tolerate this treatment. This gave the citrus industry a means of protecting itself against the possible introduction of the burrowing nematode in citrus nursery stock. It also provided quarantined citrus nurseries a means of cleaning up their infested stock so that it could be moved. The treatment of infested citrus nursery stock is being done by the State Plant Board in a special treating tank designed and built by the Citrus Experiment Station. A very similar model has been built by the State Plant Board and is be- water treatment of a number of ornamental plants under varying conditions.

Since the hot water treatment of citrus nursery stock was inaugurated, 22,590 budded trees and 67,023 seedling liners have been treated. There has not been a single complaint because of damage to the trees by the treatment. Because of the wide distribution in the state of the burrowing nematode and other parasitic nematodes, this treatment may become a standard citrus nursery practice in the future to kill these pests, unless a more suitable method of control is found.

While the State Plant Board and the Citrus Experiment Station were developing the hot water treatment, Drs. Julius Feldmesser and William A. Feder, United States Department of Agriculture Nematologists, in cooperation with the State Plant Board, were trying to find a chemical treatment that would free nursery stock of the burrowing nematode. AAventa, an organic mercurial compound manufactured in The Netherlands, was found to kill meadow nematodes and other closely related nematodes in roots when exposed to a 1.0% water solution of this chemical for one hour. About twenty of the ornamental plants tested were found to tolerate the treatment. Citrus cannot be treated with this material.

The burrowing nematode has been reported as infesting approximately 112 species of plants, representing 77 genera, and 42 plant families. This list continues to grow as more plants are examined for the pest.

In the spring of 1955, a committee composed of growers, nurserymen, and research and regulatory officials, was appointed by the State Plant Board to study and advise the Board as to what should be done with regard to spreading decline in the State. The committee decided that a program to retard its spread would be the best policy to follow until more information is available on its distribution, and until better methods of control can be developed.

Estimates of the cost of a suitable program for the period July 1, 1955 to June 30, 1957, were $3,500,000. The Florida Legislature was asked to provide $1,756,300. The United States Congress was requested to provide a similar amount. The Legislature appropriated the requested funds, but nothing was appropriated by the Congress for this work, except what was provided by the United States Department of Agriculture for research and survey.

With the appropriation of funds by the Legislature to fight spreading decline, most of the control work previously done by the growers stopped. Such work became the responsibility of the State Plant Board on a first come, first served basis. It took time to organize the control work, and to obtain the personnel and special equipment needed for large scale removal of trees and treating of soil. Arrangements were made to use existing equipment wherever possible. As of September 30, 1955, this program was only a few weeks old, but 162 acres of grove have been removed,

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and 45.5 acres have been treated with 600 pounds of DD per acre. Several hundred acres were similarly treated by the owners before the State Plant Board assumed this responsibility.

Several agencies are engaged in the various phases of spreading decline investigations, trying to find a solution to this perplexing problem. The personnel assigned to this project and the lines of study being followed are summarized below:

Organization: State Plant Board — personnel research, 4; survey and control, 23 (to be increased).

Organization: Agriculutral Experiment Station — personnel research, 7 (plus 3 part time).

Organization: U. S. Department of Agriculture — personnel research, 2; survey and control, 14.

Organization: Agricultural Extension Service — survey and control, 2 (part time).

Total personnel research, 13 plus.

Total survey and control, 37 plus.

Lines of Investigation

1. RESEARCH

State Plant Board nematologists, headed by Dr. B. G. Chitwood, are conducting cross-inoculation investigations to determine if there are strains of burrowing nematodes attacking ornamental plants that will not attack citrus. Morphological studies are also being made of the burrowing nematode taken from each species of plant with the hope of finding constant physical characters that may be used to identify those that might be found by cross-inoculation tests not to attack citrus. Success in this field could change the entire nursery control procedure from a regulatory point of view.

One State Plant Board nematologist is working directly with the ornamental nurseries to develop satisfactory control methods for use on these plants. Plant tolerance to hot water and to the more promising nematocides is being studied.

Another nematologist, working under the direction of the Citrus Experiment Station at Lake Alfred, is making further studies on the hot water treatment of citrus nursery stock, including field observations of trees treated at an earlier date.

Investigations are also being made of the nematodes associated with ornamental plants. Preliminary work indicates that these pests may be far more common in the ornamental industry than has previously been recognized.

The Florida Citrus Experiment Station has made the greatest contribution to our present knowledge of spreading decline. The scientists of the Agricultural Experiment Station are at the present time attacking this disease from many angles. Taxonomic studies are being made of strains of this pest as related to various hosts and also to the response of citrus species and varieties. Host plants, both wild and cultivated, found in the citrus groves, are being studied.

Biological and life history studies are being made to learn more of the migratory habits, and to determine the longevity of the various stages of the burrowing nematode under varying conditions of temperature, moisture and food supply.

Studies are being made of the relationship of nematodes to the soil flora; of nematode physiology; and of nematodes other than burrowing nematode associated with citrus roots.

Other Citrus Experiment Station workers are continuing and expanding the studies on soil treatments after tree removal, and on soil treatments with trees in place. Barrier studies are being continued with the best of the old materials and some new materials. In addition to the treatments being tested above, studies are being made of sytemic chemicals which when applied to the top of the tree will penetrate downward into the root system, or which if taken up from the soil, will remain in the root and act as a toxicant or repellent or nematodes. None of the systemics has shown any promise.

Another important study being made by the Citrus Station is designed to determine whether a resistant citrus rootstock can be developed which can be used in future plantings to eliminate the danger of attack by the burrowing nematode. This is a complex problem that will require a long time to solve completely.

One Agricultural Experiment Station scientist is working exclusively with avocados as they are affected by the burrowing nematode.

Another, working at Gainesville, is assisting with the burrowing nematode work by examining soil and root samples when requested to do so. A great deal of this work has been done for the State Plant Board when their own laboratories were overloaded.

Some important nematocide screening is being done by a Station scientist as a part-time project at Gainesville.

The United States Department of Agriculture nematologists are continuing their investigations of nematocides to determine their effectiveness and phytotoxicity. They are also making field trials, testing some of the more promising materials in groves and in ornamental nurseries.

2. SURVEY

The State Plant Board and the United States Department of Agriculture survey teams are continuing the collection of root samples from groves and nurseries in areas not previously surveyed to learn the extent of infestation of the burrowing nematode in Florida.

Intensive surveys are being made by the State Plant Board within individual groves and nurseries to aid in control work designed to retard the spread of this pest.

All root samples are being processed either in the mobile laboratories or in a new permanent laboratory which was established in an abandoned citrus processing plant at Lake Alfred when the State Plant Board concentrated its nematode survey and control operations in one location.

While some survey work has been done in most of the citrus-producing counties, almost two-thirds of the nurseries are yet to be examined. This will be done as rapidly as facilities available will permit.

3. CONTROL

Under this heading only the work being done to reduce the danger of dissemination of the burrowing nematode is included. Control investigations have been included under the research heading.

Control work is being done almost entirely by the State Plant Board. Infested trees are being removed and the soil treated as rapidly as possible. This work will be expanded as required during the months ahead. Infested nurseries have been quarantined where necessary to prevent the introduction of spreading decline into groves and other nurseries.

Infested citrus and ornamental nursery stock is being treated in the hot water treating tanks without charge for all who request such treatment. The requests for treatment have never approached the capacity of even one machine. It is expected that the requests for treatment will increase when the tolerances to hot water of other plants being tested are made known.

The nursery sanitation program being advocated by the State Plant Board, the Agricultural Extension Service, and the Agricultural Experiment Station is perhaps the greatest and most important thing being done today to prevent the spread of the burrowing nematode and other soil and root borne parasites by means of nursery stock. Basically, this is an educational program to get the nur-

(Continued on page 16)

Address Of President H. A. Thullbery

At 68th Annual Meeting Florida State Horticultural Society, Nov. 1, 1955

During the past year I have spent many pleasant hours reading from the past proceedings of the Florida State Horticultural Society. I recommend these proceedings to you as being most interesting and informative. But reading from the addresses of the many capable and fine gentlemen who have addressed the Society in the past, causes me to feel most humble as I address you tonight.

I first wish to acknowledge the fine work and cooperation of all those people who make for the success of this 68th Annual Meeting of the Florida State Horticultural Society.

To the local arrangements committee, headed by Chairman John Henry Logan, we extend our thanks and congratulations for an excellent job. The Chamber of Commerce, the hotel management, and staff have been most cooperative and we all appreciate the hospitality they have shown us. We owe much to the various speakers who bring us the fine messages and results of their research findings during the year.

To most of us the Society means the three day annual meeting, but to many of your officers, it means days and days of labor throughout the entire year. The only reward they receive is the satisfaction of knowing they have performed a worthwhile service to the Society and its members. I refer to those untiring workers, our Secretary, Dr. Ernest L. Spencer; our Treasurer, L. Rogers McLain; our Publications Secretary, Ralph P. Thompson; and our Editing Secretary, W. L. Tait. We are greatly indebted to them.

I would further commend Mr. Thompson and Mr. Tait on the way they have speeded up the publishing of the proceedings, cutting the time from the annual meeting to the time the members have the proceedings in hand, to one-half the time it was in former years. The cooperation of those giving papers has helped and we hope for still better cooperation.

The Sectional Vice Presidents: Arthur C. Mathias, Jr. for Citrus; Forest F. Myers for Vegetables; Charles H. Steffani for Krome Memorial; Dr. W. G. Cowperthwaite for Ornamentals, and J. Arthur Lewis for Processing, have all worked hard in preparing programs which I am sure you are finding most interesting and worthwhile.

The other members of your Executive Committee are:

Immediate Past President M. U. Mounts, Frank L. Holland, Charles M. Phillips, S. John Lynch, and Howard D. Todd. All have attended the Executive Committee meetings. oftentimes to the detriment of their personal interests. Their guidance and good judgement in caring for the business of the Society has been most helpful and is greatly appreciated.

Past President Mounts graciously accepted the chairmanship of the membership and to him, his committee, our officers and all loyal members, we are indebted for the largest membership we have had at this time in many years.

George Wedgeworth and Dexter Sloan have represented the Society on the Florida Agricultural Council. The Council has served all agricultural interests well and Chairman George will give us his report later during the convention.

We are honored in having on our program this year, Mr. Rankin, who is in charge of the Pesticide Work of the Food and Drug Administration. This indicates the interest of the Food and Drug Administration in Florida and I am sure this interest is not confirmed to the limited field of pesticide residue control. Their overall interest is that of not only protecting the public as to food supplies but in the case of Florida, which ships so much of its fresh fruits and vegetables and other raw agricultural commodities to other states in the union, we feel that their interest and approval of our agricultural products is the finest endorsement that could be given.

We wish to call the attention of every member of the Society to a report of the Citizen's Advisory Committee on the Food and Drug Administration and the recommendation made by this committee. While time does not allow me to do more than mention the matter here, when one considers the fact that the appropriation for this important branch of our government was $5,600,000 in 1952 and was cut in 1954 to $5,100,000, in the face of a greatly increased population and added responsibilities, we can easily realize the serious inadequacy and the terrific problems under which they are laboring as to money, personnel and facilities. It is possible that the Society may feel inclined to make an expression on this subject and situation.

I would now call to your attention some accomplishments of the past year by the various sections of the Society and some of the problems they are facing. For the data used here I wish to give credit to each of the sectional Vice Presidents and thank them for their cooperation in supplying this data.

While there are good text-book definitions of accomplishments, few of them adequately cover the blood, sweat and tears, the gut of research, the individual initiative, the educated guess, the fool's luck, the hunch that paid, as well as many other things that bring about the accomplishment.

The Florida Vegetable deal is really getting to be a thing to behold. It extends from Homestead to Pensacola, (and in its better years we claim Baldwin County, Alabama, too). It involves several seasons in any one year, 20 distinctively different crops, 20 different yet major areas, and a myriad of pests, soil types, and cultural, handling and marketing practices.

Citrus has long been known as "King" in Florida. Vegetables are willing to settle for a "queenly" title provided that all of you bear in mind certain references, such as "The Female of the Species" and "The Power Behind the Throne". I am sure all male members of the audience understand these implications.

Regardless of what it is called, the Vegetable Section wants it in the re-

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cord that the 1954-55 season was a successful one as far as financial returns were concerned, and especially outstanding when it is realized that planted acreages and yields for many crops were near record levels and weather losses were no greater than usual. This could not be said of some previous seasons.

The Federal legislation and regulations covering pesticide residue tolerances may have a greater influence on the vegetable deal than any other legislation.

If the practical application of this legislation is sound in every respect, if it will accomplish those things for which it was intended, if it is judiciously interpreted and enforced, even then it places a grave responsibility on all parts of the Florida Industry.

While this is being covered in a Society-wide general program tomorrow, one or two points are worth mentioning here.

In the beginning no doubt there will be periods of uncertanity, and unavailable sound practical specific answers at all levels from the field to regulatory agencies.

Florida Vegetables will no doubt be among the first to chronologically be considered in the program. Most vegetable growers expect it and few object, if all concerned are on sound ground. However, they do not favor being the guinea pig on which mistakes are made. They expect only judicious decisions from regulatory agencies.

Some vegteable growers may have some definite adjustments to make in their future pesticide practicies; however, there are others, in the majority we hope, who can proceed about as they have in the past with good sound management and common sense.

Vegetable marketing agreements have also caused quite a flurry the past year. Many educational meetings have been held. To date a tomato order has passed and a celery order referendum is now being conducted. Market agreements are under consideration on cucumbers, Irish potatoes, and watermelons.

The "Pink" Deal in the tomato industry caused much excitement. Basically it's the partial answer to a better quality tomato on the table, via harvesting in the turning pink stage and good handling. Already there have been some decided responses, some measurable in returns in favor of the venture, some dicidedly against any such shift. The real accomplishment has been that the past year has shown without doubt that it is possible to put a better quality product on the table. This must be done in crops other than tomatoes if the Florida Vegetable Grower is to continue in business against pending competition.

Some progress has been made in reduction of the number of fertilizer grades and shifting from old grades to grades of higher analysis.

Indications are the 50-year-old problem, black heart of celery, estimated at a million dollar loss annually, has this year been corrected by recent research whereby calcium is sprayed into the heart of the plant.

After many long years of selection and breeding, the Charleston Gray Watermelon came through the past season with an almost unmarred record.

The recommendation of antibiotics on bacterial spot in tomato and pepper seed beds, was a most significant step. Research continues to screen possible use through a wide range of crops. It seems only a matter of time until satisfactory safe incorporation of these materials into wide use on a number of crops will be evident.

Many more accomplishments might be mentioned if time would permit, but is it any wonder the vegetable industry is proud and requests a "queenly" name?

During the past year I was corrected by a prominent member of our Society for referring to the Processing Section as having to do with the processing of citrus and vegetables. He informed me it had only to do with the processing of citrus. Well, we were both mistaken. It should have been horticultural porducts, and if any of you have any doubt about it, look at the fine program the Processing Section has for this meeting.

The commercial production of citrus fruit crystals is an outstanding accomplishment. It opens new markets for citrus and thereby improves the entire citrus economy. The "Orange Crystal" cake advertising has focused the attention of the buying public on the product in a way that has had industry wide value. Fruit crystals and powders have been looked upon as purely synthetic and artifical. This advertising is changing that notion and creating a feeling of confidence in the new product.

The production of chilled juice has grown rapidly. It may cut into the fresh fruit market, but it seems to be the general opinion that because of its convenience it is resulting in more juice being consumed.

The Third Street laboratory of the U. S. D. A., at Winter Haven, the Citrus Experiment Station at Lake Alfred and other independent research agencies are continuing their efforts to improve the quality of concentrated juice. The Citrus, Vegetable, and Sub-Tropical Fruit industries are united in seeking badly needed enlargement of the Third Street labortory at Winter Haven so it will be adequate to do fundamental research for all three industries.

Outstanding developments are being made in the freezing and prepackaging of vegetables in Florida. Did you realize that one New York chain has signed a contract for the air delivery of 13,500 pounds of prepackaged vegetables each day to be packaged in the south campus of the University of Miami? Also, that it is said that over ten million bags of radishes were bagged in the state last spring? Avocado whip made from cull avocado will have its first commercial production this year after a successful market test last year. This should relieve the avocado growers of tons of their culls. Let us not make the mistake again that the Processing Section deals only in citrus processing problems.

Another Section of our Society that is making rapid strides is the Krome Memorial Section. The Florida Avocado and Lime Commission was created by the 1955 Legislature and appointed by Governor Collins in June. All are men well known and highly regarded in this industry.

A tax of 10c per bushel is imposed on all avdocados and limes shipped in addition to the 4c tax on the 90 pound box of limes. Authorization for spending up to $10,000.00 has been made to publicize avocados and limes this year ending June 30, 1956.

Avocado and Lime Administrative Committees have set up grade regulations on both products. Standard containers have been adopted, higher juice requirements for small limes passed, and maturity dates and sizes by weight set for shipments.

Maturity studies of avocados, limes and mangoes are being made. Dr. Paul L. Harding from the U. S. D. A. laboratory in Orlando is working in cooperation with the SubTropical Experiment Station at Homestead on these and other problems concerning cold storage and transportation.

The Lychee industry is also becoming an important fruit industry in this state. Shipments this year reached an unprecedented 30,000 pounds of fruit. Lychees are not a host of the burowing nematode.

At this point I would like to digress from sectional discussion to

something pertaining to the Society as a whole.

Nematology has finally become recognized as a high priority subject and problem, not only in Florida but is much of the modern world. Many of you will recall that in past years the extent of nematology consideration, generally speaking, was that of "root knot" on a few crops, coupled with the recommended practice of using velvet beans as crop-starving the creatures out. In subsequent years other forms of nematodes became known in connection with some Florida row crops, and then came the explosion of the burrowing nematode and its impact on our citrus and other horticultural industries. Our Plant Board, our State Experiment Stations, and U.S.D.A., now have nematologists and other scientists engaged on this specific problem.

Our Society joined hands with a number of agricultural groups in the Florida Agricultural Council two years ago in sponsoring two nematology fellowships at the University. This step, taken two years ago here in Florida, reflects the forward thinking of many people in this state.

It is possible that in our own state and possibly elsewhere, nematology has been overlooked or ignored because of very narrow lines of consideration in certain scientific areas. It is true that nematodes do not belong to the class "Insects", but it is also true that nematodes are much more damaging and therefore more important to horticulture in Florida than some insects on which much public and private money has been spent in teaching, in research and under field or farm conditions. So perhaps we can learn this second lesson with reference to nematology — that is, to be broader in our thinking.

Perhaps closely related to nematology because of soil aspects is the subject of virology. We remember the scare the word "Tristeza" gave many citrus people in our state two years ago. Virology as a subject is considered by many people to be equally as fundamental as nematology. In this instance your Society again has tried to look ahead. Your Executive Committee has been considering the possibility of the Society sponsoring a fellowship at the University of Florida at the Masters or Doctor's level in virology and I hope that the Society's membership will fully support the Executive Committee's recommendations.

The "King" and "Queen" of the horticultural industries have been mentioned and we might consider the Ornamental industry as the beautiful "Princess".

There are over four thousand horticultural and floracultural operators in this industry, doing approximately a forty million dollar business annually. The industry has grown by leaps and bounds during the last five years, and it seems there is no peak in sight. It is the consensus of opinion that in the matter of another five years, a gross of 75 to 85 millions dollars per year will be accomplished.

The industry is very concerned about the burrowing nematode hazard and is very anxious to continue its alliance with other segments of the agricultural industry to bring about as quickly as possible the containment and eradication of this pest.

Although there are many of their plants that are considered host-plants, there are many thousands that are not. In view of the expected growth and development of this industry, it is their sincere desire to cooperate with other groups within the state, and they are particularly interested in keeping their merchandise as clean as possible in order that it might be admitted to any state in the union. Even at this time there are hundreds of nurserymen who are operating under better sanitary methods and making every effort not only to clean up and eradicate but to make sure that this pest will not come back to their nurseries.

Much damage has been done to their business because of loose and unwarranted use of the word "ornamental" plants, and many unproved statements have been made about the spread of the burowing nematode. However, they are of the opinion that this was done without any direct intent to injure their business. Only within the last few days, California has clamped a partial quarantine on Florida plants. The Ornamental industry stands ready to cooperate in any program designed for the best interest of all in the containment and eradication of the burrowing nematode. Past performance proves their sincerity.

Last but not least let us consider old "King Citrus". The members of the Society closely associated with the Florida Citrus industry over the years have witnessed its tremendous growth, its winning fights against Citrus Canker, the Mediterranean fruit fly, hurricanes, freezes, and low prices.

During the year just passed you have seen frozen orange products continue to make spectacular gains, leaving most operators with low inventories of orange products at the beginning of the season. You have seen grapefruit prices skid during a season of light production when, if past performance is any criterian, they should have gone up. This prompted the legislature to pass a law requiring 10% more juice for grapefruit during the early part of the season in hopes the better quality would bolster a low market.

It is the opinion of many growers this change was for the better, but prices have dropped as heavy shipments reached the market. These low prices present a challenge to the grower to raise fruit on a basis that will show a profit and of such quality as will give consumer satisfaction in fresh as well as processed form.

As stated before, this Society has always been foremost in waging and conducting research and related programs so that the citrus industry would continue to make mighty strides forward. Today this industry and members of this Society face the greatest challenge in their history, the control of the **burrowing nematode.**

The eradication of the Mediterranean fruit fly and Citrus Canker have gone down as the greatest eradication programs ever carried out by any industry in the world; however, the problems faced in these programs were by no means near the magnitude of those faced in the control of the **burrowing nematode.** There are several reasons for this:

1. The amount of citrus has increased tremendously. As an example, in the season of 1935-36 the State produced 29,512,000 boxes but in 1953-54 this had increased to 138,670,000. This means that any program of control has to be much larger at its very inception.

2. Spreading Decline, the disease caused by the burrowing nematode, cannot be positively identified in the field. It requires trained people in a well equipped laboratory to identify this nematode.

3. This nematode has an extremely wide range of host plants.

4. The treatment of the burrowing nematode, in addition to being costly, puts acreage completely out of production for a number of years and requires special equipment.

Many growers in areas where there is little or no spreading decline are showing more interest than they did a few months ago, as they realize it is to their interest to ferret out small infestations and control them in the early stages rather than to wait until large acreages are attacked.

Some people, however, are waiting

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Federal-State Market News Service

By Herb Mosher

HARRY WILLSON SERVES CITRUS INDUSTRY WELL

When it comes to long and useful service to the citrus industry of Florida . . . H. F. "Harry" Willson, chief of the Federal-State Market News Service, in Lakeland, ranks right at the top. Through the years the industry depended upon him for market information, which always came in on time, and in 1955 the service is, if anything, even better than ever before.

I first knew Harry Willson, and his wife, Rosie, (and she always has been

H. F. WILLSON

indispensible in the Federal-State office) in Orlando, at the time that the first Federal Citrus Control Committees (under a Federal Marketing Agreement) were established. O. G. Strauss was the first secretary of these committees, and of the "control board."

Those were interesting days, in the mid-30's. The Willsons had offices in the Exchange Building, near Federal Citrus Control Board headquarters in the same building. The industry had a "volume prorate," with the result that one shipper (for instance), who had been shipping right about 25 CARS per week, was given a "prorate" of 220 BOXES, approximately, for a week. This, and other similar developments, simply blew the lid right off the "volume prorate" setup — and many changes followed, in quick succession.

For one thing, Harry Willson and his "market news service" moved to Lakeland, in 1936. The late L. P. Kirkland of Adams Packing Co., Auburndale, was instrumental in bringing this about. These were the days of Governor Dave Sholtz and his "honest men" whom he appointed to the first Florida Citrus Commission. My very good friend, Luther Chandler, of Goulds, was long a chairman of this group. Mr. Kirkland, finally, after many long years of service to the industry, passed along to the Great Beyond, where all good citrus people eventually must go. However, Luther Chandler still is with us, and so are a good many others who helped to build up Florida citrus during those important, constructive years, when the business went from a disorganized but interesting kind of rugged-individualism, with hundreds of shippers playing an important role, to the present situation with its mergers and controls by just a few. Harry Willson and his Federal-State Market News Service remained in Lakeland, ever since the move to that place in '36.

However, prior to the move to Orlando, then to Lakeland . . . the Willson's were at Winter Haven. The Federal-State Market News Service went there during the 1928-29 citrus shipping season. Mr. Willson had just arrived from the grape deal in Fresno, California. Offices were set up in the DeWitt Taylor Building, not far from the offices of the Florida

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Many years a favorite source of soluble magnesia for Florida soils. Used extensively in fertilizer mixtures for citrus crops and vegetables. Especially useful and economical for direct application where only magnesia is required.

Florida growers now consider magnesium a primary plant food in the same category with nitrogen, phosphorus and potash.

The recommendations of the Flordia Citrus Experiment Station at Lake Alfred, published in January 1954, stress the need for large application of magnesium for Citrus in soluble form and state that it is usually applied as a Sulphate.

Ask your fertilizer manufacturer for EMJEO, long a dependable source of this key plant food.

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. Magnesium .
. For a Full Harvest .

Citrus Growers Clearing House Association, headed by the late "Archie" Pratt, who was definitely one of the leading figures of Florida's citrus industry in those days and for all time to come.

When the Willsons were active in Winter Haven, and the "clearing house" was functioning there, the citrus industry of Florida passed through what were some of the most colorful days in its long and interesting career. Growing and shipping fruit, then, was a bit more enjoyable than today. Life was not quite so complex or strenuous and the growing and marketing of fruit was not so hampered by various limiting factors as in 1955.

The men who led the industry then truly can be described as "giants," and their names long will be remembered, by those who are interested in the development of Florida citrus. Harry Willson held his important place then as now.

What does Willson do for the citrus industry today? Well, for one thing, there is that "daily citrus report" which tells as much about the markets as it is possible to know.

Almost everyone in the industry gets this report.

Willson's "daily report," issued 5 times weekly, includes such information as rail shipments to leading markets from Florida, Texas, California, Arizona, Louisiana — also truck movements from Florida, California, and Texas. There is a breakdown on "rail" for "east, west, south," also a breakdown on rail shipments, Indian River section of Florida. The number of boxes of fruit "processed" each day, and to same date this year and last year . . . will be found, easily, on the bulletin. There is much auction data. This is sub-divided into "interior" and "Indian River." These "weighted averages" on the ten (10) auctions are furnished to the industry through he coopertation of Florida Citrus Exchange, and this arrangement has continued right down through the years. The daily sheet is one of the most important items to arrive, each day, in the citrus sales rooms of Florida.

The "weekly auction summary," with prices for 1's and 2's, covering the terminal markets completely, is Florida's "citrus history" of great importance to sales managers. The "daily sheet" also tells about car arrivals, by states of origin, for the terminal markets. Number of cars on track, cars unloaded . . . on 16 cities "arrivals and number of cars on track," plus "truck receipts on 12 leading markets" — all this, and much more data are included. There are "jobbing prices" for Atlanta and New Orleans.

There are two completely new ideas of information on Willson's daily citrus report sheet this year. First, Fred Motz and Don Rubel of the U. S. Department of Agriculture's "foreign agricultural service" are furnishing Willson with weekly data on the European fruit auctions. Typical: — London, Antwerp, Hamburg, and Rotterdam report on fruit received from such places as South Africa, Surinam, Florida, Brazil, Hondouras, Israel, California, and other exporting areas.

Secondly, there is now the consolidated report of rail-truck receipts, car lots and car lot equivalents, in 29 markets. "We hope to increase this from the present 29 to around 75 cities," Mr. Willson told me, late in October, as this little article was being finished up for The Citrus Industry magazine.

Willson's daily sheet also gives, once a month, a report on unloads (rail) for 100 cities in the United States, plus 5 Canadian cities.

The "CND Service" (Commerical News Dispatch) goes out from time to time, each day, by telegraph, to most

ONE MORE REASON why JOHN BEAN Speed Sprayers are

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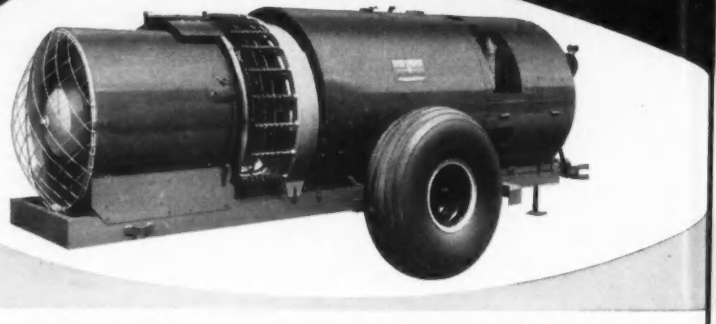
After a sandblasting operation, the inside surface of every Speed Sprayer tank is sprayed with molten zinc, then coated with high grade synthetic varnish. Result: a tank that's the most rust-free and corrosion resistant ever developed.



Almost 85% of the commercial citrus acreage in Florida is sprayed by John Bean Speed Sprayers and the reasons why are clear. Speed Sprayers are built in Florida to meet Florida growers' needs. They do an outstanding job and save labor and spray materials in any type of grove, regardless of tree size or spacing. And metallized tanks are just one of many construction features that make them stand up under year after year of hard use with a minimum of maintenance. Write or call us for a Speed Sprayer demonstration — today!

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for figuring concentrate or dilute spray solution is yours for the asking. Write for your copy.

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XUM

of the citrus sales offices of Florida, and to many other interested parties. As fast as market news of importance is received . . . out it goes! There is a "nominal rate" on this sort of telegraphic service. There is complete auction information by CND. Also, the Associated Press is a subscriber to this service and Willson's data is thereby circulated through the newspapers, via AP, to all points carrying such news about Florida citrus. The Federal-State office calls a number of citrus offices collect, each day, by prearrangement, as quickly as the important market news comes to Lakeland.

Who pays for this Federal-State citrus service which has served the industry so long? Well, it is divided 50-50 between the U. S. Department of Agriculture, and the Florida State Marketing Bureau. Neill Rhodes is commissioner of the Florida bureau, while Si Smith, director of the fruit and vegetable division (USDA) and C. D. Schoolcraft, head of the market news branch . . . figure prominently in the Federal setup.

The Willsons are now located in offices in the Daugherty Building, Lakeland, not far from the Florida Citrus Commission building. Once they were in the same building with the Commission, but when the Commission got its own building, the Federal-State people located at present headquarters. And should any one, any where, any time . . . desire detailed information about the Florida citrus industry, past and present, may I suggest that the Willson's would be the people to see about it? If they do not know, hardly any one would!

What these two important and hard-working citrus people don't know about Florida citrus . . . well, it just isn't worth knowing, or remembering.

Willson's "Annual Citrus Report," is, of course, a classic with the industry. This bulky publication, filled with good and useful information, is considered indispensible by industry members who like to know what's going on, and has gone on, in citrus. The report on the 1954-55 season came out just a few days ago, as this paragraph is being written for the December issue of The Citrus Industry magazine. Willson has a short, snappy, but very complete summary of the entire season, in just a few pages, at the beginning of the book. Then there are pages upon pages of records for last season. A citrus sales manager, wanting to know what

(Continued on page 15)

GOOD CITRUS FERTILIZERS

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Water-Soluble Double Sulfate of Potash-Magnesia ($K_2SO_4 \cdot 2MgSO_4$) 22% K_2O—18% MgO

SUL-PO-MAG DELIVERS DOUBLE POWER

Sul-Po-Mag, which is most effective as part of a complete fertilizer, supplies *magnesium* and *potash*, both in quick-acting, water-soluble form.

SULFATE OF MAGNESIUM—Here's soluble magnesium that enables your crop to make full use of all the other plant foods. It improves citrus yield, flavor, size and color, and helps keep your groves healthy, too.

SULFATE OF POTASH—A premium form of potash that contains *less* than 2.5% chlorides and can be safely used to boost the yield and quality of any crop which is sensitive to chloride toxicity.

CITRUS fertilizers containing *Sul-Po-Mag* are better fertilizers . . . better balanced and more effective. That's why so many manufacturers of *quality* fertilizers use *Sul-Po-Mag* in their citrus grades. So see your fertilizer field representative now and order your favorite brand in a grade containing *Sul-Po-Mag* . . . it pays!

SUL-PO-MAG IS ON THE AIR

WDBO Orlando—"March of the Day" 6:55 A.M. Tues.-Thurs.-Sat.

WJAX Jacksonville—"Weather Roundup" 6:45 A.M. Mon.-Wed.-Fri.

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Natural Enemy Of Citrus Likely To Benefit Florida Growers

Brumus suturalis, a beneficial lady beetle imported about a year ago from Pakistan, may aid native lady beetles in controlling certain Florida citrus and vegetable pests, the U. S. Department of Agriculture reports. Brumus feeds on many Florida insect pests, including aphids, psyllids, whiteflies, mites, some scale insects, and mealybugs.

This lady beetle is one of several beneficial insects discovered by USDA's George W. Angelet during his two-year (1953-54) assignment to India and Pakistan. He is currently working in the Far East, looking particularly for insect enemies of an alfalfa-destroying aphid that in the last two years has become a serious menace to this crop throughout southwestern United States.

Entomologist Allen G. Selhime of the Department's Fruit Insect Field Station, Orlando, Fla., who is studying Brumus, points to the variety of harmful insects consumed by the lady beetle as an assuring factor that it will become established and should continue to thrive. If it should fail, it will not be for lack of desirable food.

So far, 19 releases of Brumus have been made in Florida. Groves on a no-spray program were chosen to give this predator the best possible chance to become established. Temple oranges and tangerines were selected when possible, as they put out flushes of new growth more readily and furnish a better supply of aphids than other varieties.

The first successful introduction of one insect to destroy another took place many years ago in California, where the cottony cushion scale threatened the existence of the State's citrus industry. Insecticides used in the control of this insect had proved ineffective. Growers were making preparations to have their trees removed. At the same time, in its native Australia, the cottony cushion scale was being kept in check by its natural enemies. Knowledge of this prompted USDA to send an entomolologist to Australia in 1888 to search for these natural enemies. The most important insect enemy of this citrus pest was found and shipped to California. Eighteen months later, the California orchards were practically cleared of the cottony cushion scale.

Brumus will continue to be reared on an experimental basis for some time to determine its effect on insect pests and to work out spray programs that will give this predator the best opportunity to survive and attack injurious insects.

If the lady beetles are able to establish themselves, they are expected to spread and start new colonies throughout the areas where they are acclimated.

ADDRESS OF PRESIDENT THULBERRY AT ANNUAL MEETING HORT. SOCIETY

(Continued from page 10)

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for an easy, inexpensive cure when there is none in prospect at this time. With all sincerity I respectfully suggest to the representatives of the press when one of these "miracle" cures is presented, before publishing the story that they contact our public research agencies and determine whether or not there is any scientific basis for the cure rather than to publish the story and have the telephone lines of these agencies clogged with calls for days following the publication. The amount of damage likely to be caused in such a case is unestimable.

Realizing that if this problem is not solved the industry stands to lose 50,000 acres of citrus within the next ten years, the state legislature made available $1,700,000 to initiate a program of control. This was done on the recommendation of members of the industry, most of whom are outstanding members of this Society. If the purposes of this program are to be accomplished, if adequate research is to be done, it will require the cooperation of every segment of the citrus industry. This Society through its annual meeting and publication of the Proceedings has done more to keep the growers well informed on the subject of spreading decline than any other organization. Being well informed is not enough. This program now demands the active support of every grower on a year around basis. The State Plant Board is now actively engaged in the process of controlling this disease in groves by the pull and treat method. Research agencies are putting forth every effort to find a better method of control. This may be done in time but in all probability it may be many years before a better method is found. It behooves every citrus grower, large and small, to cooperate with the State Plant Board in every way possible

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Millions have taken the baths at Hot Springs—America's only health resort with natural thermal waters under the regulation of the Director of the Nat'l. Park Service, U.S. Dept. of the Interior —and, countless people have testified to the magic qualities of these world-famous baths. You, too, can find relief for jangled nerves, aching muscles, stiff joints, hardening of the arteries, and, yes, even rheumatism and arthritis.
THE Majestic
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From $3 per day single
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And you can budget your meals at $4.50 a day
MAJESTIC COTTAGES
HOT SPRINGS
NATIONAL PARK, ARKANSAS
SEE YOUR TRAVEL AGENT OR WRITE THE MAJESTIC HOTEL FOR LITERATURE

to stop spread of this insidious disease.

The Proceedings of this Society tell the story of every advancement made in the growing of citrus fruits. It is our hope that in years to come they will tell how the Florida citrus industry overcame the greatest threat to its existence, the burrowing nematode.

I wish to close my remarks by quoting from the annual address given in Jacksonville, May 1, 1955, by George L. Taber, then President of our Society: "There is one great basic principle upon which we have built and are building, which is that all of us, from grayhaired veterans down to the youngest acquisition to our ranks, **are but scholars.** We recognize fully that no matter how much of value we may have learned, there yet remains much more of value to be acquired; and it is this very quality of receptivity and power to healthily assimilate new ideas that gives us strength. Dudley W. Adams, our first President, never uttered a greater truism than that the man who 'knows it all' is of no use to either himself or anybody else; that such a one could be of no benefit to this Society and we could be of no benefit to him. I am happy to say we have no such members."

CITRUS INSECT CONTROL FOR DECEMBER, 1955 . . .

(Continued from page 3)

ferably when foliage is moist with dew.

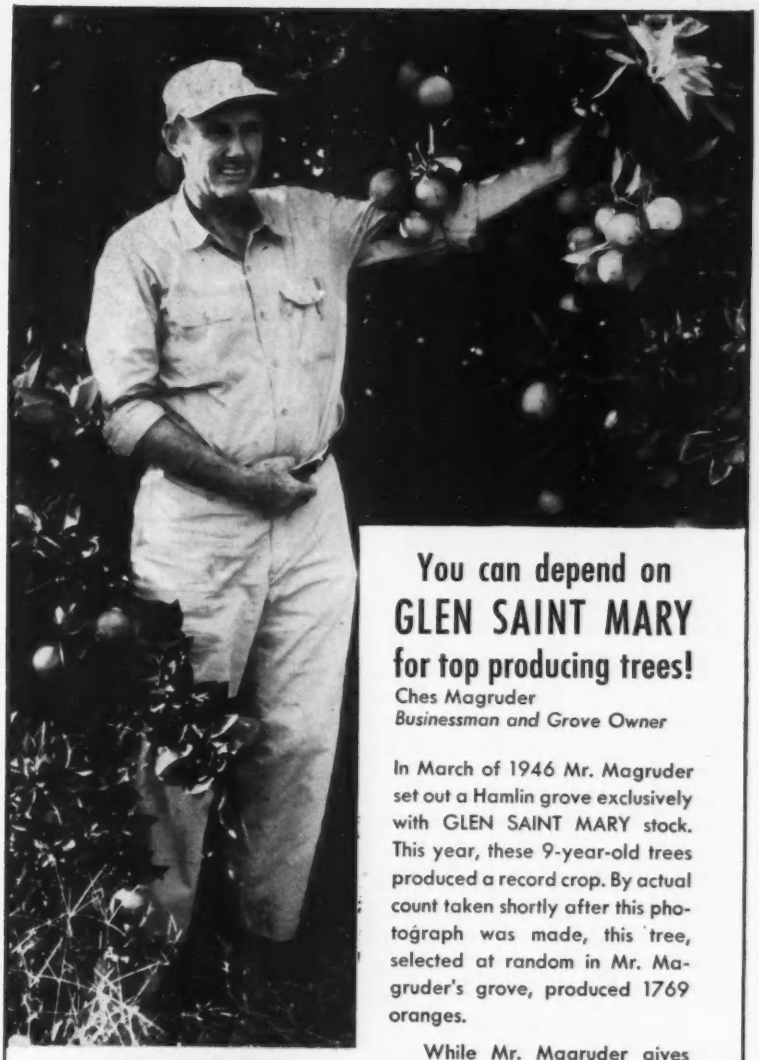
For more detailed information refer to the 1955 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

FEDERAL-STATE MARKET NEWS

(Continued from page 13)

happened on a certain day "last season" . . . well all he needs to do is to thumb through the "Annual Citrus Report."

One sales manager, whom I contacted on a recent trip, asked me to have "six copies of Willson's annual report mailed" to him . . . when he learned I was going to be in the Federal-State office, at Lakeland, next day. He wanted them for each of his men, who are working the northern markets, as well as a copy or two for the sales room. The newspapers await this annual citrus summary each year — usually publish a good bit of it in full. Copies are still available at the Lakeland office, I am informed, though they are beginning to become scarce. A file of the annual reports, saved through the years, is indeed an important part of any citrus library.



You can depend on
GLEN SAINT MARY
for top producing trees!

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Businessman and Grove Owner

In March of 1946 Mr. Magruder set out a Hamlin grove exclusively with GLEN SAINT MARY stock. This year, these 9-year-old trees produced a record crop. By actual count taken shortly after this photograph was made, this tree, selected at random in Mr. Magruder's grove, produced 1769 oranges.

While Mr. Magruder gives ample credit to the good care his grove has received, he says a lot of praise must go to GLEN SAINT MARY'S fine nursery stock. Another example of the reliability of the GLEN SAINT MARY NURSERIES COMPANY . . . dependable since 1882.

When planning your next grove, contact . . .

Glen SAINT MARY NURSERIES COMPANY

Largest Citrus Nurseries in the World

Executive Offices: WINTER HAVEN, FLORIDA

"DEPENDABLE SINCE 1882"

Heaton Heads March of Dimes

Wendell C. Heaton, Tallahassee Attorney, has been appointed Florida State Chairman for the 1956 March of Dimes it was announced recently by Basil O'Connor, President of the National Foundation for Infantile Paralysis, Inc.

Heaton has been a resident of the State since 1924 and was President of the Florida Federation of Labor from 1931 to 1939. He was the first Chairman of the Florida Industrial Commission, serving in this capacity for four years, and has served as Director of the State Chamber of Commerce. A veteran of World War I, Heaton served as Chairman of the National Advisory Committee of the U. S. Department of Labor from 1935 to 1939 and also as Director of the General Council during this period. Mr. Heaton served as Deputy Commissioner for the Florida Industrial Commission until the early part of this year. He is a member of the Florida Bar Association, American Legion and Veterans of Foreign Wars. He is a Mason and Shriner.

A PROGRESS REPORT ON THE BURROWING NEMATODE WORK IN FLORIDA

(Continued from page 7)

seryman to use clean propagating material and sterile soil, and to be careful not to contaminate soil after it has been sterilized. Such a program, if properly executed, can drastically reduce the danger of spread of the burrowing nematode and other nematodes from nurseries. This method of propagation entails expense and close supervision. Careless work can result in ineffective control of the pests, and bitter disappointment for the nurseryman.

The research program outlined here, and the survey work being done in Florida today are designed to provide information on which to base an intelligent control program. Our control work must stay flexible in order to take advantage of new information as it becomes available. Any part of the present program found to be ineffective or unnecessary will be modified to conform to new findings made available through research.

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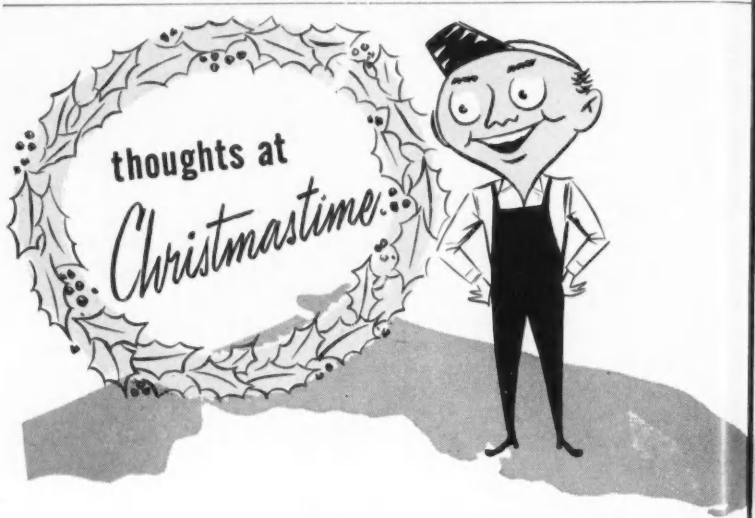

December is a month of relaxation — of happiness and joy — of planning for the months ahead for the men in the citrus and cattle industries in the State of Florida.

At this particular time, the Superior Fertilizer and Chemical Company — all of its employees, from the president right down to the newest laborer — wish to take this opportunity to thank the two Florida industries which have grown so greatly in the past few years — citrus and cattle.

It is our sincerest hope that we might be able to better serve these industries in the coming years.

Our staff of agricultural experts, backed by a wonderful group of production men and an ever faithful office force, together make up a group which, with the citrus and cattle folk, constitute a wonderful American heritage called "teamwork."

Everyone at Superior joins in wishing you a Very Merry Christmas and a Most Successful New Year.

BAG OR BULK *Superior is cheaper because of the service!*

SUPERIOR
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TAMPA—P.O. Box 1021, Phone 4-4131
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USDA PROPOSES STANDARDS FOR GRADES OF DEHYDRATED ORANGE JUICE (CRYSTALS)

The U. S. Department of Agriculture on November 23, proposed the issuance of United States Standards for Grades of Dehydrated Orange Juice (crystals). The proposed standards were developed at the request of processors and users of the product. The grades are U. S. Grade A or U. S. Fancy; U. S. Grade B or U. S. Choice, and Substandard.

The proposed standards apply to a granular product which has been reduced to less than 3 per cent moisture and packaged with a desiccant to further reduce the moisture content. The product reconstitutes to the equivalent of single strength orange juice by the addition of a specified amount of water.

The quality of the product is evaluated principally on the color, absence of defects, and flavor of the reconstituted juice.

Other important requirements for Grade A are a Brix-acid ratio of not less than 12 to 1 nor more than 18 to 1 and a recoverable oil content of not less than 0.006 nor more than 0.012 ml. per 100 ml. of the reconstituted juice. Comparable Grade B requirements are a Brix-acid ratio of not less than 10.5 to 1 nor more than 19 to 1 and a recoverable oil content of not less than 0.008 nor more than 0.20 ml. per 100 ml. of the reconstituted juice.

Interested persons have until December 27, 1955, to submit views or comments on the proposed grade standards to the Fruit and Vegetable Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C.

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The West Indian . . . Or Barbados Cherry

(Concluded From Last Issue)

One year old plants, either from seed, cuttings, or air layers, can be set in the field. In a year's time, the cuttings and air layers will develop a good root system in the containers and the seedlings will be about 1 to 2 feet high. The plants can be set out at any time of the year, but April to June just before the rainy season in Florida is best. Plants will sometimes flower and fruit the second year, but they will not be bearing heavily until the third or fourth year.

Soil. The plants have grown well in the alkaline rockland of south Dade County and have also done well in the acid sands of Central Florida provided root-knot is not much of a problem. The West Indian cherry should not be planted in any area that is subjected to flooding for the plants will be killed if stagnant water stands over the roots for periods of more than a few days at a time.

Plantings. The plants should be set 12 to 15 feet apart both ways, or 12 feet apart in the rows and 15 feet between the rows. In this way 280 plants can be set out in one acre. The West Indian cherry can be planted as a hedge, setting the plants about 2 feet apart. In 5 to 7 years they will make thick growth and be about 12 feet high.

Fertilizing. The plants are dormant in the winter months, from December to March. With the onset of warm weather in March and April, vegetative growth begins and flowering takes place shortly after on the new growth. At the Sub-Tropical Experiment Station good results have been obtained by fertilizing with a 10-0-10 mixture in early March just before the new growth emerges. This fertilizer mixture will encourage good growth and flowering. About ½ pound per tree 3 to 4 years old is sufficient. In May, July and September a 4-7-5-3 mixture, or a 6-4-6-3 for older plants that have been fertilized for several years is used. One half pound to 1 pound of fertilizer per plant, depending on the size and age of the plant, is sufficient, and it is broadcast on the ground from near the central trunk to 1 to 2 feet beyond the leaves.

Irrigation. An adequate supply of water is very beneficial in promoting good growth and maximum yields of large fruit. Rainfall is usually sufficient during the summer and fall months, but irrigation is needed during dry spring months. The fruits produced during this period are often small and shriveled because of lack of sufficient water. Irrigation at this time should be at least twice a week. It is not necessary to irrigate when the plants are dormant.

E. BRUCE LEDIN

Pruning. All plants, when they become several years old, benefit from annual pruning which encourages greater yields. Some seedlings produce numerous branches and form a thick type of growth. These plants should be thinned out frequently to produce heavier yields. Other seedlings tend to grow upright and with open growth; the upright branches can be cut back to encourage more side branching. The pruning can be done in the late fall and winter months during the dormant period and before new growth begins.

Insects and Other Pests. The West Indian cherry is infested by several types of scale insects and these infestations are followed by sooty mold. Oil emulsion spray or parathion, or a mixture of both, may be used if infestations become too severe. It is not recommended, however, that the plants be sprayed with oil and parathion during periods of fruiting. At least three species of plant bugs have been observed to sting the fruit, resulting in misshapen and pitted fruits. The southern green stink bug or pumpkin bug, and the leaf-footed plant bug have done the most damage to the fruit. It is usually not necessary to apply control measures, since the fruit flavor does not seem to be affected by these bugs.

The root-knot nematode has been found infesting roots of the West Indian cherry. This nematode weakens the plant, and severe infestations may inhibit its growth and result in poor fruit production. The nematode is one of the limiting factors in growing the West Indian cherry in Florida. It is more of a problem in the sandy acid soils than in the alkaline rock soils of Dade County. If the plants are mulched heavily with straw or some other suitable material, fertilized regularly, and watered during dry periods, they will grow, flower, and fruit well in spite of the root-knot.

The use of species of Malpighia that are root-knot tolerant or resistant as a root stock for the West Indian cherry as been tried, but the plants thus grown tend to be dwarf and produce low yields.

SELECTED CLONES

There are no named varieties of the West Indian cherry, although several selected clones have been propagated at the Sub-Tropical Experiment Station and are on test. Some are tart or acid and one selection is sweet. The tartness of the fruits is not an indication of the amount of ascorbic acid content, for the sweeter tasting varieties have as high ascorbic acid content as some of the tart ones.

When grown from seeds, considerable variation occurs. In selecting for propagation by vegetative means the following should be considered: 1) They should produce heavy yields. There is no standard that can be set up to determine this except by taking yield records of many different seedlings and comparing them. The higher yielding seedlings should be selected for propagation. 2) The plants producing the largest fruit along with heavy production should be selected. 3) Those fruits with high juice content are preferred. This is usually associated with large size. 4) Those fruits with high vitamin C content are perhaps most desirable although since most seedlings have

more vitamin C than other fruits this may not be so important for the average grower. Any fruit that analyzes over 1,000 mg. per 100 g. would be satisfactory. However, if the vitamin C were to be extracted or used to enrich other fruit juices, those clones possessing the highest vitamin C content would be preferred. 5) The flavor of the fruit, whether tart or sweet, depends on the use of the variety. For home planting, to eat the fruit out-of-hand, a sweeter tasting one is preferred. For processing or freezing, the tart varieties are some times preferred. 6) The growth habit is important; the more erect, open growth is preferred to the lower, spreading and thick type of growth.

USES*

The skin of the fruit of the West Indian cherry is very tender and easily bruised when handled. It will not hold up well after harvest and, therefore, should be utilized as soon as possible. Its main use as a dooryard fruit is as a fresh fruit eaten out-of-hand, but if the fruit is utilized shortly after harvest, it can be used in various ways, such as a juice, ice sherbet, syrup, ice cream, jelly, preserves, punch, etc. The fruit is not very satisfactory for pies and jam, as the pits do not separate easily from the flesh.

In selecting the fruit for processing, half-ripe fruit, as well as ripe fruit, can be used. Only the too-green or very overripe fruit should be discarded. In extracting the juice on a large scale, a paddle-pulper, similar to that used in making tomato juice, can be used to mash the fruit and to eject the seeds and pulp. An electric blender may be used provided it is not used too long, as the stones will be chopped up and add a bitter flavor to the juice.

* Thanks are expressed to Mr. George MacFie of the University of Miami Food Laboratory for information concerning some of the uses of the West Indian cherry.

Ice. One of the easiest and most satisfactory methods of utilizing the fruit, is as a frozen juice or ice. The fruit is washed, mashed, put through a sieve to take out the pulp and seeds; sugar is added and the mixture is frozen. The juice can be frozen in any type of box container—plastic box, polyethylene bag, or even in a paper milk carton. When served, the ice is cut into squares as individual pieces and served while still frozen.

Juice. The freshly squeezed, strained, and sweetened juice can be served

(Continued on page 22)

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Reports Of Our Field Men . . .

SOUTH POLK, HIGHLANDS, HARDEE, DeSOTO AND SARASOTA COUNTIES

C. R. Wingfield

The matter of moisture is fast becoming serious in this area. Lakes, ponds, and streams are the lowest they have been for some years. During the second week of November there was a drizzle for a day that yielded perhaps 3/10th of an inch. A great help but was soon gone.

This moisture condition has delayed this fall fertilizer application but those with suitable irrigation have or will go ahead. Fruit has been moving fairly well but from reports not as fast as last year. Most of the early orange crops are sold but growers appear to be holding off selling pineapples until nearer maturity.

There has been a considerable infestation of rust mite and red spider. Also scale has been a problem. A study of your insect problem is advisable and the proper control made.

WEST HILLSBOROUGH AND PINELLAS COUNTIES

J. A. Hoffman

Two days of much needed rain early in November brought between three and four inches of precipitation throughout this section, which up to that time was badly in need of moisture. Many groves were being irrigated prior to the showers.

Red Spider and rust mite are quite active in this section. A close watch should be kept and a spray or dust applied if infestations appear to be on the increase.

The Fall application of fertilizer is in full swing and should be completed by the middle of December.

A number of melon growers are plowing and cultivating some very fine looking blocks of land preparatory to having their planting done by the end of December.

NORTH CENTRAL FLORIDA

V. E. Bourland

We've had a long stretch of dry weather, growers were watering young trees, also had started irrigation on old groves, but we had nice rains on the 9th and 10th. Some gauges registered around 5 inches, and it has changed the looks of all groves. Has been beneficial to growers to help control red spider or purple mite which had started considerable damage to trees before this rain.

Fruit is coloring up very nicely also seems to be of better quality than previous years. The late bloom is sizing up good, and at present looks as if it is going to be good at picking time.

A very small acreage of vegetables will be planted around Winter Garden. I think melon crop in my territory will be about the same acreage as last year. Rains have been very beneficial to pastures as they had begun to suffer from drought.

HIGHLANDS AND POLK COUNTIES

J. K. Enzor, Jr., & R. E. Lassiter, Jr.

By the middle of November most growers in this area have completed their Fall fertilizer application.

While the northern part of the Ridge area received a nice rain the week of November 7th, the area from Babson Park south did not receive very much. Many growers in this area are still irrigating. This rain was very welcome since some groves had experienced considerable damage from mesophyll collapse which in some cases was probably caused by dry weather and dry winds, and in other cases caused by purple mites. In some locations both of these factors were involved.

In some blocks rust mites have been heavy on the leaves. These infestations should be watched closely since it is possible for rust mite to cause leaf drop under the right conditions.

The current market for oranges seems to be holding up well. However, the grapefruit deal leaves a lot to be desired. This is in spite of the fact that the general grapefruit crop seems to be a very high quality as far as external conditions are concerned.

SOUTH HILLSBOROUGH AND MANATEE COUNTIES

J. D. Toll

By the second week of November many groves were suffering from a lack of moisture and some young groves which weren't being irrigated had begun to wilt. A 2½ inch rain at that time generally covered this area and was welcomed by the growers.

Most groves have had the Fall application of fertilizer.

This season's first pint of strawberries from the Plant City area has been auctioned at the Plant City Farmer's Market.

At this time the tomato crop in the Ruskin area looks very good. Many tomato growers have begun to harvest and it won't be long before the packing houses are operating near capacity.

Many vegetable growers are preparing their land for the Spring crop. It is advisable to have the soil analyzed and the proper sweetner applied if the pH is too low.

EAST HILLSBOROUGH AND PASCO COUNTIES

E. A. McCartney

Groves and pastures are looking much better after the rain last week — 3 to 4½ inches over this section. Fruit is moving in larger volume. Early oranges have dropped from the 1.25 to $1.50 on the tree of two weeks ago but there are still some moving at $1.25 down to $1.10 to $1.15 depending on quality.

We are in the middle of the Fall fertilizing program. Something new in citrus fertilizing. The bulk spreader seems to be coming forward very rapidly and is being used to a great extent where middles are not too close and they can get through without much damage to trees and fruit.

Vegetables are moving to markets — good to fair prices are being paid. The first strawberries of the season showed up at Plant City market so it won't be long until they will be moving in greater volume.

Melon growers — the optimist of all growers have most of their land cleared and will soon be planting and by the way in case there are some that do read this monthly letter I wish to apologize for an error in last month's issue of The Citrus Industry where it stated that melon growers were planting. This should have said planning. I may have been responsible but this article goes through several hands after it is written. This mention is especially for my melon grower friends.

XUM

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Uncle Bill Says:

Seems as if they is always sumpin' to worry about if'n a guy jist wants to concentrate on the job of worryin' . . . and us citrus growers and vegetable growers in Florida don't need to hunt around fer a lot of things to fret over, 'cause they is plenty of things that comes right to us that we kin be concerned about . . . but in the long history of Florida's citrus and vegetable growin' they ain't never been any trouble which afflicted us that somehow or other wasn't licked . . . so fer as I'm concerned I ain't goin' to develop any more grey hairs than nature has already provided me . . . 'er develop ulcers over any of the numerous difficulties that face us today . . . 'cause I know that, while it may take some time to lick all our troubles the'r goin' to be licked, jist like they always has been in the past.

Fact of the matter is I figger that if I jist keep on treatin' my crops with the best fertilizer I kin buy, 'n keep after the bugs and pests that is always with us and take care of 'em like they ought to be cared fer I'll come out pretty good.

Then, too, I kin remember back when a lot of us growers was so hard up that we got discouraged and let our groves and fields sort of go to the dickens . . . but, like always, conditions got a lot better pretty soon and us fellers who hadn't sold out fer next to nothin' has been gittin' along pretty well since that time.

Tain't goin' to be long until Fair time in Florida and we'll all have a chance to see in Tampa and Winter Haven and other places over the state exhibits showin' just what fine crops we kin produce in this grand old state . . . 'n fer our money they ain't no place in this whole universe where nature has been so kind to the growers than right here in Florida . . . 'n fer me I'm goin' to stay here until the end of the line.

And another thing, I know if I keep on usin' Lyons Fertilizers I'll keep on producin' Maximum Crops of Finest Quality.

THE WEST INDIAN . . . OR BARBADOS CHERRY

(Continued from page 19)

as a fresh fruit juice. Lime juice can be added to make the following concentrate: 1 part West Indian cherry juice, 1 part lime juice and 1 part sugar. This mixture is frozen in containers similar to those used for concentrated citrus juices. When served, 3 parts water are added to 1 part concentrate.

The juice blends well with mango concentrate, and also with pineapple and soursop juices. It also blends well with orange juice and can be used to build up the flavor, color, and ascorbic acid content of certain types of low solid orange juices. One commercial use of "Acerola" juice is as an additive to apple juice to supply a natural sources of vitamin C for body food juices.

The juice blends well with rum, as well as gin, to make a refreshing drink. The juice can also be fermented to make a wine.

It has been suggested that the juice can be used as an anti-oxident for preserving dried and frozen fruit. The ascorbic acid is used with citric acid for this purpose. The mixture is effective in preventing browning which takes place during the drying of many fruits.

Syrup. To the freshly squeezed juice, pectin and sugar are added to make a light syrup. This can be used over ice cream, pancakes, waffles, cereal, and fresh fruit slices.

Jelly. A good jelly can be made from the fruit. The juice should be strained and put through a fine cloth to make a clear jelly. Pectinol can be added to digest the pectin to give a clear jelly.

Ice Cream. The syrup can be mixed with vanilla ice cream. Or the syrup can be injected into vanilla ice cream to make a variegated type, similar to the new type of orange and mango ice cream.

Preserves. The fruit can be cooked whole, with added sugar, taking care that the fruits are not cooked to a mush, and sealed in jars as a preserve.

FROZEN CONCENTRATE ORANGE JUICE STANDARDS REVISED

The U. S. Department of Agriculture recently announced a revision of the United States Standards for Grades of Frozen Concentrated Orange Juice to become effective December 1, 1955.

The revised standards increase the minimum Brix value from 41.5 to 41.8 degrees in the Style I concentrate without sweetness added.

Classified Ads

SUPERIOR CITRUS TREES — Now accepting orders for Spring 1956 delivery. Sorry — we are sold out of Valencia and Hamlin, but have good supplies of other varieties. Call 2-7541 for quotations. Leaflet "Tips for Growers" mailed on request.

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HERB MOSHER

When Herb isn't writing on some citrus topic for this publication, or an "Outdoor Florida" column for some Florida newspapers, or buying citrus fruit for some of his mid-western connections, he is fishing — evidently with satisfactory results as indicated by the above illustration.

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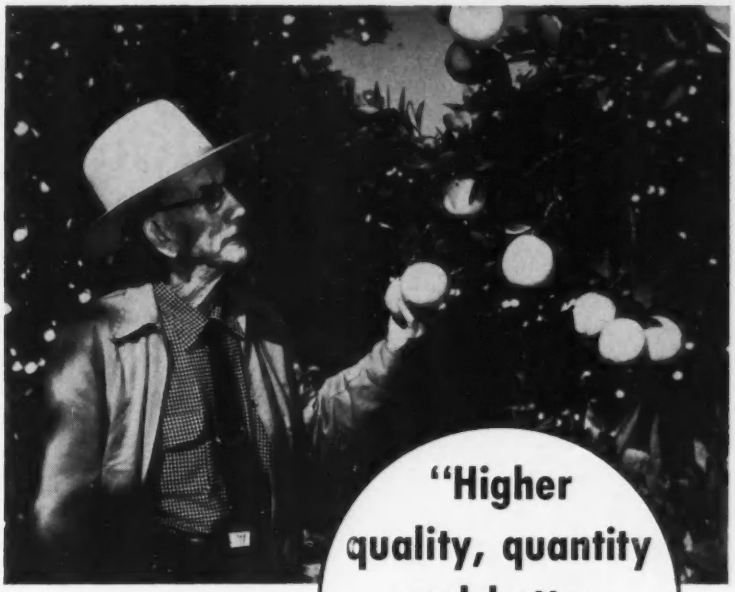

Wesley J. Mann, Frostproof, pioneer Polk County citrus grower, inspects his d/p DOLOMITE-conditioned crop.

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